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Synopsis of the Classification of Neotropical Tortricinae, with Descriptions of New Genera and Species (Lepidoptera: Tortricidae)

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The Tortricoidea is a large, worldwide superfamily, consisting of the single family Tortricidae. Included are more than 5000 described species, members of two, three, or four subfamilies, and 6 to 19 tribes, varying with taxonomic opinion. In the Holarctic, the subfamily Tortricinae and its generic and tribal concepts are fairly well established, and there is general agreement among contemporary researchers between classifications used in the Old and New World faunas. As one proceeds into the Neotropical Region, however, many of the generic and tribal components become less clearly defined, or are replaced by other, often poorly known taxa. A much greater proportion and diversity of the known fauna has not been described, even at the species level, and many species which are described have been assigned artificially to obsolete generic groupings.

Thus there has been no comprehensive modern classification of New World tortricine moths. After the importance of genitalic characters was recognized, August Busck began an extensive study of Nearctic and Neotropical tortricid taxonomy in the 1920's, but little of his work was published (Busck, 1940), although some of his concepts were passed on as new generic names on specimens. Later contributions gradually established a generic classification for most North American species, particularly Obraztsov's treatment of the Palearctic fauna (Obraztsov, 1954–1957), and aided by an unpublished thesis on Sparganothini (Lambert, 1950), Freeman's (1958) revision of the Archipini, and our studies of genera of other tribes (Obraztsov, 1959a, 1962, 1963; Obraztsov and Powell, 1961; Powell, 1962, 1964; Powell and Obraztsov, 1977).

As a result, we have realistic placements of nearly all of the 250 described species, which are assigned to 31 genera (Powell, 1983), although several additional genera are described (Powell, 1985, present paper) or are defined in manuscript for species of the U.S. or Nearctic parts of Mexico.

In the Americas south of the U.S., about 450 species group names have been applied to the Tortricinae s. str. (exclusive of the Cochylinae and Chlidanotinae). About 415 species are considered to be valid; the remainder of the names are synonyms. This total includes North American species that range into the Antilles or Mexico. The descriptive era for Neotropical Tortricinae occurred primarily before the modern period when dissections and illustrations of genitalic characters had been employed as the main basis of classification. Most of the species (65%) were described between 1863 and 1920 by Walker, Zeller, Walsingham, Meyrick, Dognin, and Busck, and many others were added during 1920–1938 by Meyrick,

who rigidly rejected the use of genitalic characters after they came into widespread use. Only 16% of the species names originate since 1940, although there are a great many undescribed species in collections.

Dissections of type specimens and preliminary steps towards refining systematic placements have been made for most of the described Neotropical species by Clarke (1949, 1956, 1958, 1963), who illustrated most of Meyrick's species, by Obraztsov (1959b, 1966a, 1966b, 1966c, and unpubl. studies), and by Razowski (1964, 1966, 1979, 1982a, 1982b, 1982c). Nonetheless, about 30% of the species remain without meaningful generic placements.

N. S. Obraztsov continued the work on a generic classification begun by Busck, and he studied the type specimens of most of the Neotropical Tortricinae during tenure at the American Museum of Natural History, New York, under sponsorship of National Science Foundation grants, during 1956–1965. Unfortunately, Obraztsov's research was terminated prematurely by his sudden death in 1966, and his card catalog of world Tortricidae was transferred to the British Museum (Natural History), London, making it inaccessible to Western Hemisphere researchers. Nevertheless, his notes and photographs of type specimens remain at the AMNH, and these have been invaluable in development of a classification.

I inherited the Neotropical tortricine project and began comprehensive research in 1970–1971, while a visiting research fellow at the Smithsonian Institution, Washington, D.C. I studied the Neotropical species of Sparganothini, both the older material used by Lambert, and the extensive more recent acquisitions accumulated in Washington and at Berkeley, as well as the type specimens in the BM(NH). This resulted in considerable revision of Lambert's (1950) concepts because he had not seen the type specimens of most of the older Neotropical species and had misinterpreted application of the names. In addition, I developed a catalog to all described Neotropical Tortricinae, based on library research and notes from Obraztsov. I studied the BMNH and U.S. collections and proposed tentative generic assignments for the described species for all tortricine tribes. Based in part on further study at the British Museum in 1984, this list has been revised to provide a basic framework for the classification of Neotropical Tortricinae (Powell and Razowski, 1986). This checklist defines 6 tribes, with 55 genera (Table 1). Among the described genera, 13 represent taxa described from the Holarctic, one is introduced from the Australian region, and the rest are exclusively Neotropical or are distributed in the Boreal Nearctic element of Mexico, extending northward only to the southwestern U.S. Effectively half the endemic genera, 21, have been described recently by Razowski (loc. cit.), Powell (1980) or in the present paper. The new genera help to establish a more complete framework for the described fauna, but it is obvious that much more extensive generic realignment and descriptions of many new genera will be necessary to bring an understanding of the Neotropical fauna into perspective with that of the Holarctic. The new genera are described here in order to make the names available for the forthcoming checklist.

The wing venation nomenclature follows that of Common (1970) and Horak (1984). Other abbreviations as follows: DC = discal cell of forewing; FW = forewing; HW = hindwing. Portions of the ductus bursae are described from basal (at the ostium bursae) to distal end of the invagination.

Table 1. Synopsis of the classification of Neotropical Tortricinae. (See Obraztsov, 1954–1957, or Powell, 1983, for synonymies of genera originally described from the Holarctic, indicated by an asterisk *.)

Tribe ATTERIINI Busck, 1932
ANACRUSIINA Diakonoff, 1961
Anacrusis Zeller, 1877
Archipimima Powell, 1986
Atteria Walker, 1863
Holoptygma Powell, 1986
Templemania Busck, 1940
Tina Powell, 1986
Tinacrucis Powell, 1986
Sisurcana Powell, 1986
Tribe SPARGANOTHINI Walsingham, 1913
NIASOMINI Powell, 1964
Aesiocopa Zeller, 1877
*Amorbia Clemens, 1860
Anchicremna Meyrick, 1926
*Coelostathma Clemens, 1860
Paramorbia Powell & Lambert, 1986
*Platynota Clemens, 1860
Rhynchophyllis Meyrick, 1932
Sparganopseustis Powell & Lambert, 1986
Sparganothina Powell, 1986
*Sparganothis Hübner, 1825
Sparganothoides Lambert & Powell, 1986
TRIBE ARCHIPINI
*Argyrotaenia Stephens, 1852
Subargyrotaenia Obraztsov, 1961, new synonymy
*Choristoneura Lederer, 1859
*Clepsis Guenée, 1845
Idolatteria Walsingham, 1913
Tribe CNEPHASIINI Stainton, 1859
*Decodes Obraztsov, 1961
Decodina Powell, 1980
Tribe EULIINI Kuznetsov and Stekol'nikov, 1977
*Anopina Obraztsov, 1962
Anopinella Powell, 1986
Apolychrosis Amsel, 1962
*Apotomops Powell & Obraztsov, 1986
Bonagota Razowski, 1986
Chileulia Powell, 1986
Chrysoxena Meyrick, 1912
Clarkeulia Razowski, 1982
Deltinea Pastrana, 1961
Deltobathra Meyrick, 1923
*Dorithia Powell, 1964
Ecnomiomorpha Obraztsov, 1959
Neoeulia Powell, 1986
Nesochoris Clarke, 1965
Orthocomotis Dognin, 1905
Sociophora Busck, 1920
Paracomotis Razowski, 1982
Paraptila Meyrick, 1912
Proeulia Clarke, 1962
Pseudomeritastis Obraztsov, 1966
Quasieulia Powell, 1986
Rebinea Razowski, 1986
Rhythmologa Meyrick, 1926
Seticosta Razowski, 1986
Uelia Razowski, 1982
Tribe TORTRICINI Guenée, 1845
*Acleris Hubner, 1825
Apotoforma Busck, 1934
Emeralda Diakonoff, 1960
*Croesia Hübner, 1825
Tribe PHRICANTHINI Diakonoff, 1981
Phricanthes Meyrick, 1881
(introd. from Australia)
Unplaced Genera
Apinoglossa Moeschler, 1890
Hypostromatia Zeller, 1866

TRIBE SPARGANOTHINI

Sparganothidae Walsingham, 1913.
Sparganothinae Busck, 1940.
Sparganothidini Diakonoff, 1961 (in part).
Sparganothidina Diakonoff, 1961.
Sparganothini Kuznetsov & Stekol'nikov, 1973.
Niasomini Powell, 1964.

The genera of Sparganothini described here share the following character states. *Head:* Antenna unmodified, scaling in two bands per segment. Labial palpus elongate, porrect; II segment length greater than 2× eye diameter, enlarged 1.8–

2.0× basal diameter. Maxillary palpus minute or rudimentary. Chaetosema small. *Forewing:* Broad, length 2.4–2.6× width. Length of DC 0.55–0.60 FW length. Accessory cell (chorda) absent; R_3 separate from $R_4 + R_5$, which are stalked with rare exceptions, R_4 to costa, R_5 to termen. No upraised scale rows or tufts (as there are in *Platynota, Synnoma,* etc.) *Hindwing:* Ten veins (including CuP), humeral vein absent; base of RS lost; CuP remaining, weak or a trace. No costal penicillus in male. *Abdomen:* No enlargement of VIII in male; no corethrogyne ovipositional scaling in female. *Male genitalia:* Uncus well developed, slender basally, without ventral setal tuft. Saccus not differentiated. No hami or subscaphium. Socii large, flat, kidney bean-shaped, extended posteriorly beyond attachment near middle; with dense elongate scaling. Transtilla complete, dentate, not fused to pulvinus. Valva simple, not plicate, pulvinus present, "clasper" absent; costa narrowly sclerotized or undifferentiated. Aedeagus without external spurs; vesica with a dense bunch of deciduous cornuti, attached laterally near base (base notched in *Sparganopseustis*). *Female genitalia:* Papillae anales weakly sclerotized compared to Atteriini, without differentiated setae. Ductus bursae well differentiated from corpus bursae, without antrum or accessory sac. Corpus bursae globose, without accessory pouch, signum a nearly straight or curved, well sclerotized crease.

Based on recent research, J. S. Dugdale (*in litt.*) believes that Sparganothini possess a rudimentary gnathos which arises from the gnathos base sclerite, separate from the socius base sclerite. According to this interpretation, the socii in several genera (e.g., *Sparganothis, Platynota*) are complex, two-part structures, and the so-called "gnathos arms" of prior taxonomists and in the descriptions that follow actually are lobes of the socii.

Sparganothoides Lambert & Powell, New Genus

Type species.—*Sparganothis hydeana* Klots, 1936.

Head: Antennal setulae in male >2× segment diameter, borne on raised ridges. Labial palpus II segment enlarged at ca. middle, slightly curved; III segment ca. 0.4 as long as II. Scaling of frons slightly roughened or smooth with crown cap. Ocelli well developed. Periorbital strip bare. *Forewing:* Length of DC ca. 0.55 FW length; width of DC ca. 0.17 its length; Cu_{1b} arises 0.50–0.54 along length of cell; stem of M absent or weak (not visible on unstained wing) in cell, ending between M_1 and M_2; CuP present. Costal fold in male present or absent. *Hindwing:* Sc + R_1 and Rs closely adjacent, crossvein lost; Rs and M_1 closely adjacent, connate or short-stalked; M_3 and Cu_{1a} connate. Cubital hair pecten absent or nearly so in male, present in female. *Abdomen:* Dorsal pits absent. *Male genitalia:* (Klots, 1936, fig. 4) Uncus slender, simple or enlarged or forked apically. Gnathos arms separate, enlarged laterally into broad, paddle-like, setate clubs apically, or rarely only weakly enlarged. Transtilla finely dentate. Valva large, rounded; sacculus narrowly sclerotized, simple. Aedeagus slightly bent, pistol-shaped. *Female genitalia:* (Klots, 1936, fig. 5) Papillae anales parallel-sided, somewhat rectangular. Sterigma wide, box-shaped, well sclerotized dorsad and ventrad of ostium, lateral lobes not produced. Ductus bursae rather short, gradually enlarged distally; colliculum present, split ventrally, cestum not developed. Corpus bursae large, with undifferentiated scobination; signum long, nearly straight.

Sexual dimorphism.—Slight; size and color pattern similar, females average

slightly larger in some species. Males possess well developed antennal setulae, a costal fold in some species and in one undescribed species a curious, longitudinally parted scale development on the head and thorax.

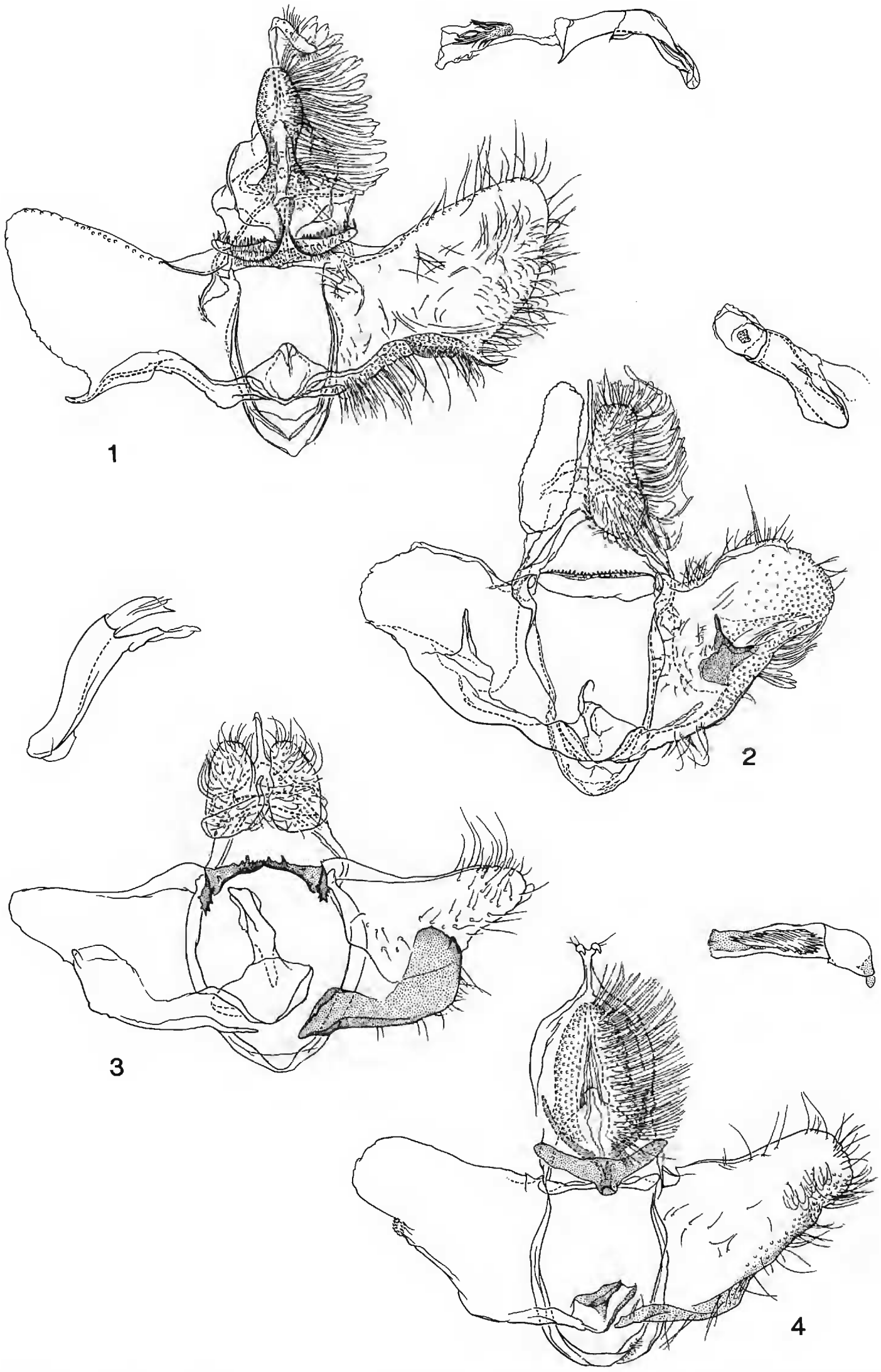
This new genus was conceived by Lambert (1950, Genus II), who later proposed the name *Sparganothoides* in a partially revised manuscript and assigned the following species: *S. albescens* (Walsingham, 1913), *S. castanea* (Wlsm., 1913), *S. hydeana, S. lentiginosana* (Wlsm., 1879), *S. lugens* (Wlsm., 1913), *S. machimiana* (Barnes & Busck, 1920), *S. morata* (Wlsm., 1913), *S. schausiana* (Wlsm., 1913), *S. spadicea* (Wlsm., 1913), and *S. vinolenta* (Wlsm., 1913). These and about 20 undescribed species are distributed from Arizona to Costa Rica. Lambert differentiated the group on the basis of the broadly, laterally expanded apices of the gnathos arms and by the anellus, which is produced posteriorly, with the manica attached beyond the middle of the aedeagus. However, the latter feature is variable in *Sparganopseustis* n. gen., described below. *Sparganothoides* also differs from *Sparganothis* Hbn., to which it appears most closely related, by having the sexes subequal in size and appearance.

Sparganothoides albescens, S. lugens, S. schausiana, and at least three undescribed species possess a forked uncus, yet they are quite dissimilar in other features. Their assignment to this genus is provisional. Several undescribed species have the gnathos arms attenuate or only slightly enlarged apically, which will further complicate the integrity of *Sparganothoides* when the species are thoroughly studied.

Sparganopseustis Powell & Lambert, New Genus

Type species.—*Sparganopseustis martinana* Powell, new species.

Head: Antennal setulae in male moderately elongate, 1.60–1.75× segment diameter. Labial palpus II segment enlarged distally, slightly curved, with long scaling; III 0.40–0.67 as long as II. Scaling of frons modified, erect at base, sparse, smooth above, hidden beneath long, rounded hood of scaling from vertex. Ocelli rudimentary to well developed. *Forewing:* Length of DC 0.58–0.60 FW length; width of DC 0.15–0.17 its length; Cu_{1b} originates 0.60–0.65 along length of cell. Stem of M present in DC, without trace of fork, ending between M_1 and M_2; R_4 and R_5 usually stalked (usually separate in *S. ningorana* and *S. flavicirrata*); CuP present or a trace. Cubital hair pecten lacking in male, absent to weakly developed in female. No costal fold in male. Apex acute, subfalcate in most species. *Hindwing:* Sc + R_1 and Rs separate, crossvein reduced to a trace; Rs and M_1 stalked; M_3 and Cu_{1a} connate or short-stalked. *Abdomen:* Dorsal pits usually indicated on II in some species, absent on most. *Male genitalia:* (Fig. 1) Uncus weakly to moderately enlarged apically. Socii broadened posteriorly, elongated into clubbed projections anteriorly (evidently fused with gnathos arms). Gnathos rudimentary at base, weakly sclerotized, joined to socii by membranous connections, thence produced as separate, usually clubbed, distally setate arms. Transtilla usually enlarged medially. Valva oval; pulvinus rudimentary; sacculus narrowly to broadly sclerotized to beyond middle of valva, with a pronounced emargination in some species, usually with a free tip. Aedeagus pistol-shaped to evenly curved. *Female genitalia:* (Fig. 13) Papillae anales flat, rather oval, diverging anteriorly. Sterigma a broad plate posterior to ostium, sometimes weakly bowl-shaped but without pronounced lateral lobes. Ductus bursae straight, membranous, gradually enlarged



Figures 1–4. Male genitalia of Tortricinae, ventral aspect with valvae reflexed; aedeagus removed and shown in lateral aspect. 1. *Sparganopseustis martinana* Powell. 2. *Paramorbia rostellana* (Zeller). 3. *Sparganothina xanthista* (Walsingham). 4. *Sisurcana furcatana* Powell.

distally; colliculum split ventrally, located just proximal to ductus seminalis; cestum absent. Corpus bursae large, with pronounced scobination (spiculae in *myrota* complex); signum extending around half the bursa perimeter, a small membranous pouch protrudes just basad to signum (sometimes rudimentary).

Sexual dimorphism.—Pronounced; color pattern differs in all species, often markedly so. Males in most species have secondary features: either an expandable scale tuft of labial palpus; an eversible, densely scaled coremata between abd. II & III dorsally; or modified, erect scaling of the hindwing dorsally.

The genus is distributed from Arizona to Peru and includes the following described species: *S. acrocharis* (Meyrick, 1932), *S. aurolimbana* (Zeller, 1866), *S. elimata* (Meyr., 1930), *S. flaviciliana* (Walsingham, 1913), *S. flavicirrata* (Wlsm., 1914), *S. geminorum* (Meyr., 1932), *S. myrota* (Meyr., 1912), *S. ningorana* (Wlsm., 1914), *S. niveigutta* (Wlsm., 1913), *S. tessellata* (Wlsm., 1913), and *S. unipunctata* (Wlsm., 1914), each of which is known only from one sex. *Sparganopseustis martinana* is selected as the type species because there is an unequivocal collection of both sexes (27 males, 17 females) from one seasonal sample at one locality. In addition, I have reared F_1 sibs of two undescribed species in northern Mexico and have examined recently collected series of three others from Oaxaca, Mexico, Costa Rica and Venezuela in which association of the sexes can be inferred.

Although available material was so scant that correlation of males and females could not be made for any species, Lambert (1950) perceived this series of species to comprise an undescribed genus (his Genus IV). However, he failed to recognize the character that I believe is a fundamental synapomorphy, the uniquely derived socii-gnathos complex. Instead, Lambert defined the genus on a series of features, no one of which was common to all of the included species. Interpretation of the morphology is debatable; either the gnathos is rudimentary and its function has been taken by modification of the socii, or the two structures are fused. In any case, this is fundamentally different from all other New World Sparganothini. A similar arrangement occurs in *Lambertiodes harmonia* (Meyrick) in India, but in that species the rudimentary gnathos arms are joined medially and are not connected to the socii, which are drawn out into elongate arms anteriorly. Lambert (1950) misinterpreted this and described the gnathos as having free arms, as did Diakonoff (1959) when he described the genus *Lambertiodes*. Horak (1984) thought that the gnathos arms are apically separated and fused to the lower edge of the socii, but I believe the apically free arms are a development of the socii and are not connected to the joined gnathos arms. The relationships of these structures are difficult to see on slide-mounted preparations, particularly if they are severely flattened in the standardized method favored by many lepidopterists, but they are more easily interpreted in dissections in fluid. Lambert assigned *harmonia* to a monotypic new genus (his Genus III), a decision which was followed by Diakonoff shortly after Lambert's death. I consider the development of the gnathos and socii in *Lambertiodes* to be separately derived from that of *Sparganopseustis*, a parallel event that does not indicate relationship. *L. harmonia* resembles some species of *Sparganothoides* Lambert & Powell in size, color pattern and lack of appreciable sexual dimorphism.

***Sparganopseustis martinana* Powell, New Species**

Male.—Length of FW 10.0–11.8 mm (30n). *Head:* Labial palpus moderately elongate, length of II segment ca. 1.6 eye diameter; scaling white interiorly, pale

orange-brown exteriorly. Scaling of crown tan flecked with orange-brown. Ocelli present, reduced. *Thorax:* Dorsal scaling tan, mottled with orange-brown; venter white. Legs whitish, prothoracic mottled with brownish. *Forewing:* Ground color rosaceous brown to pale purplish brown uniformly mottled with indistinct transverse strigulae; maculation poorly defined, dull ochreous, and strigulate: two broad, transverse fasciae, one from costa well before middle, angled outward into cell; the second beyond middle separated from 1st by a band of ground color of equal width, extending towards tornus, becoming indistinct or lost in tornal area; a faint blotch in subapical area; fringe yellowish, preceded by a darker line of ground color. Underside brownish showing the upperside pattern more distinctly, to mostly pale ochreous, obscuring pattern. *Hindwing:* Basal half covered by broad, erect, pale androconial scales on a brownish to ochreous-brown ground, distal half becoming pale ochreous except indistinctly brownish at margin. Underside whitish, faintly brownish in anal area. *Abdomen:* Dorsal pits readily evident on II as unscaled depressions but not on descaled pelt. I and II with apparent androconial scales dorsally; remainder of dorsum shining pale brownish; underside and genital scaling whitish. Genitalia as in Figure 1 (drawn from paratype, JAP prep. no. 2885; 4n).

Female.—Length of FW 10.2–12.4 mm (17n). Essentially as described for male except FW color pattern and lacks specialized scaling of HW and abdomen. *Forewing:* Entirely pale rust-brownish, strigulate with slightly darker brownish; fringe as in male, yellowish preceded by a darker line; maculation absent (2n) or distinct: two white or ochreous costal triangulate marks, the first at midcosta, subtended by, sometimes connected to a dot just above cell; second smaller beyond end of cell; sometimes a dot beyond lower corner of cell. *Genitalia:* As in Figure 13 (drawn from paratype, JAP prep. no. 5523; 2n).

In both sexes one individual also has black smudges on dorsal margin basally and before tornus.

Holotype male and allotype female.—Mexico, 10 mi W of El Salto, Durango, 8800 ft, Aug. 1, 2, 1964, at lights (J. A. Chemsak & J. Powell) (UCB). Paratypes (46): 5 ♂, 3 ♀ same data as holotype except VII-23 to VIII-2-64; 21 ♂, 13 ♀ same data except 9000 ft, VII-23 to VIII-11-64 (J. E. H. Martin & W. C McGuffin); 1 ♂ Mex., 8 road mi W El Palmito, Sinaloa, 6400 ft, VIII-8/12-72, at lights (C. D. MacNeill, D. Veirs & Powell), 3 ♂ same data except X-12-75 (Chemsak & Powell) (CNC, UCB, USNM).

There is a population in the Huachuca Mountains, Arizona, that may be conspecific. Adults are morphologically indistinguishable from typical; specimens taken in April are comparable in size to the type series, but August moths are smaller. Most males (6n) resemble the typical but have a paler, more washed-out FW pattern, while others (2n) have the FW unicolorous tan with only a faint indication of the pattern. Females (3n) lack the white costal markings. Two males and one female have some dorsal infuscation, as in the type series (AMNH, CNC, UCB).

Paramorbia Powell and Lambert, New Genus

Type species.—*Oenectra rostellana* Zeller, 1877.

Head: Antennal setulae elongate in male, 2× segment diameter. Labial palpus II segment nearly straight, enlarged at middle, with widely flared scaling; III segment ca. 0.3 as long as II. Scaling of frons erect at base, appressed above,

crown with weak to well developed hood. Ocelli absent or present. Periorbital strip bare, with a single row of scales ventrally. *Forewing:* Length of DC ca. 0.58 FW length; width of DC 0.17 its length; Cu_{1b} arises ca. 0.55 along length of DC; stem of M absent; CuP present. No costal fold in male. *Hindwing:* Sc + R and Rs adjacent, a trace of crossvein r persists; Rs and M_1 short-stalked; M_3 and Cu_{1a} separate; CuP represented by a crease. No cubital hair pecten. *Abdomen:* Dorsal pits absent. *Male genitalia* (Fig. 2): Uncus very slender, slightly curved. Gnathos absent. Transtilla finely dentate. Valva with pulvinus weak with sparse setae; sacculus variable, sclerotized but not distinctly defined posteriorly, extending to beyond middle of valva, with one projecting spur on or recessed from margin. Aedeagus short, stout. *Female genitalia* (Fig. 14): Papillae anales oval, moderately well sclerotized. Sterigma a rather simple plate posteriodorsad to ostium, with lateral lobes. Ductus bursae slender, straight, without colliculum; cestum absent, or as weekly sclerotized lateral bands extending to corpus bursae; latter large, signum an elaborate, nearly complete ring, elongated into two broad flanges curved distally into bursa.

Sexual dimorphism.—Slight; males have elongate antennal setulae; females possess more elongate labial palpi, are larger and tend to be darker in color. The wing patterns are similar. Associations are based on a short series taken at Rancho Grande, Ar., Venezuela (males of which compare well with the type of *P. rostellana* from Colombia (BMNH)), and on an undescribed species in Costa Rica.

In addition to *P. rostellana,* the genus includes *P. ithyclina* (Meyrick, 1926), *P. chionophthalma* (Meyr., 1932) and at least two undescribed species, all in Colombia and Bolivia, and one undescribed species in Nicaragua, Costa Rica and Panama.

In an unpublished treatment of Neotropical Sparganothini, Lambert (1950) included the species listed above in a proposed new genus (Genus I), with *Epagoge somatina* Dognin, 1912, as its type species. I believe this concept was based on an undescribed species similar to *P. ithyclina* from Colombia, which had been misidentified as *E. somatina* by Busck. Lambert also considered as congeneric the species here assigned to *Sparganothina,* n. gen., because he erroneously perceived members of that group also to lack the gnathos. Later, in a partially revised manuscript, he had decided that *E. somatina* was not a sparganothine, and although he proposed the name *Paramorbia* for the new genus, he did not designate another type from the remaining species, nor did he discuss diagnostic characters that would distinguish the group. The male of *E. somatina* still is not known with certainty, but its similarity to *Philedone aluminias* (Meyrick, 1912), which is known only from males, suggests that the two, if not a single species, are closely related. There is no doubt that both are Atteriini.

With the removal of *E. somatina* and separation of *Sparganothina,* the restricted *Paramorbia* is a discrete group with no close affinity to other described Sparganothini. Presumably the loss of the gnathos is a parallel reduction in *Amorbia* and *Paramorbia* and is not indicative of relationship. The projecting spur of the sacculus and the uniquely derived form of the signum, as well as the distinctive forewing pattern, serve as synapomorphies distinguishing this genus.

Sparganothina **Powell, New Genus**

Type species.—*Sparganothis xanthista* Walsingham, 1913.

Head: Antennal setulae in male short, ca. 0.7 segment width; scale band on

basal part of segment reduced. Labial palpus II segment moderately enlarged, from before middle to well beyond, scarcely curved, with broad scaling dorsally and ventrally. Scaling of frons appressed, sparse. Ocelli reduced to a trace or lacking in male. Periorbital strip scaled. *Forewing:* Length of DC ca. 0.6 FW length, width of DC 0.20 its length; Cu_{1b} originates at ca. 0.70 along length of cell. Stem of M in DC absent, represented by a crease; CuP absent, represented by a faint crease. No costal fold in male. Transverse band scaling roughened in fresh specimens but no bands of upraised scales. *Hindwing:* Sc + R_1 and Rs separate, adjacent basally, with partial crossvein; Rs and M_1 short-stalked; M_3 and Cu_{1a} separate. No cubital hair pecten. *Abdomen:* No dorsal pits. *Male genitalia* (Fig. 3): Uncus moderately strongly curved, slightly enlarged apically. Socii not fused to gnathos, which is a weak transverse ridge dorsad to socii. Transtilla heavily sclerotized, with large lateral and small median spurs. Valva simple with weak pulvinus; sacculus large, heavily sclerotized, enlarged distally, with a projecting spur. Aedeagus slightly curved. Anellus in *S. xanthista* greatly elongated posteriorly, extending beneath aedeagus to its distal end in repose (but not in the other species). *Female genitalia* (Fig. 15): Papillae anales narrow, enlarged distally. Sterigma a shallow bowl subtending a broad, densely spiculate plate (*xanthista*) or with spiculate lateral lobes or unmodified. Ductus bursae without colliculum or cestum. Corpus bursae large; signum developed into a broad, nearly closed ring near proximal end of bursa.

Sexual dimorphism.—Slight; forewing pattern and shape similar; female apparently averages slightly larger.

Sparganothina is characterized by several apparent synapomorphies: the loss or reduction to a trace of the ocelli and of vein CuP of the forewing; the rudimentary, joined gnathos; and the heavily sclerotized sacculus, which is enlarged distally with a free tip or projecting spur. In females, the nearly closed, collar-like signum constricting the corpus bursae is distinctive.

The genus is proposed for *S. xanthista* and *S. amoebaea* (Wlsm., 1913), both of which were described from Guerrero, Mexico, and I have undescribed species similar to both from Sinaloa, Durango, and Vera Cruz, Mexico. In addition, *S. nephela* (Wlsm., 1913) from Panama and *S. decagramma* (Meyr., 1932) from Santa Catharina, Brazil, are provisionally referred to *Sparganothina,* although they differ in several details.

Sparganothina xanthista and *S. amoebaea* were described on the basis of males from Amula, Guerrero. The type specimen of *S. xanthista* lacks its abdomen; however the cotype (USNM), which was dissected by Lambert (RL #433) is superficially indistinguishable, as are three specimens with the same label data as the types, a male and two females (BMNH, USNM). My dissections of males collected recently in Guerrero (JAP 4957, vic. Iguala; JAP 5510, vic.Tixtla) show variation from the cotype, especially in the transtilla and sacculus, but the close phenotypic similarity of the moths and their near geographic and seasonal (Aug.–Sept.) origins are convincing that all represent one species and that the females are correctly associated. Moreover, in series of three undescribed species that resemble both *S. xanthista* and *S. amoebaea,* males and females are phenotypically quite similar. Thus, *S. xanthista* is selected as the type species of *Sparganothina*; the female of *S. amoebaea* is unknown.

As noted above, Lambert (1950) included *S. amoebaea* and *S. xanthista* in his Genus I, along with members of the genus now described as *Paramorbia.* Pre-

sumably this was because he thought the two Mexican species lacked the gnathos, as there is otherwise little similarity between the two species complexes. His later pencilled revisions to the manuscript indicated that *S. amoebaea* "should go with *Philedone aluminias* and *Epagoge somatina,*" apparently based on a photograph of the type slide of *amoebaea* (BMNH 3707, JDB), but *S. xanthista* was not included in this imponderable misinterpretation. Hence, Lambert did not recognize the relationships presently conceived for *Paramorbia* and *Sparganothina.*

TRIBE ATTERIINI

Atteridae Busck, 1932.
Atteriini Powell, 1964.
Anacrusiina Diakonoff, 1961.

The genera of Atteriini described here share the following character states. *Head:* Maxillary palpus tiny, not visible on whole specimen. Scaling of frons appressed or roughened above middle, without hood. Chaetosema well developed. *Forewing:* Discal cell short, 0.53–0.60 FW length. R_3 separate from $R_4 + R_5$, R_4 to costa, R_5 to termen; M_3 and Cu_{1a} separate. No upraised scale rows or tufts. *Hindwing:* Ten veins (including CuP), humeral vein absent. No cubital hair pecten or costal penicillus in male. *Abdomen:* No dorsal pits. Female with elaborate, differentiated corethrogyne scaling on venter of VI and VII (unknown in *Sisurcana*). *Male genitalia:* Uncus well developed, strongly sclerotized. Saccus not differentiated. No hami or subscaphium. Socii large, scaled, not produced posteriorly beyond basal attachment, not fused to gnathos. Gnathos arms strongly sclerotized, joined, smooth. Transtilla complete, dentate, not joined to pulvinus. Valva simple, not plicate, lacking "clasper." Aedeagus slightly to strongly bent, pistol-shaped, without external spurs. *Female genitalia:* (excluding *Sisurcana*). Papillae anales broad, comparatively well sclerotized, without differentiated floricomous setae. Ductus bursae slender, well differentiated from corpus bursae, without accessory sac. Corpus bursae large, globose, without accessory pouch; signum a large, hollow keel projecting inward, without capitulum.

Sisurcana Powell, New Genus

Type species.—*Sisurcana furcatana* Powell, new species.

Head: Antenna thickened basally, short, less than 0.5 FW length; setulae in male 0.8 to 2.0× segment diameter; scaling in two bands per segment, sometimes reduced on basal half. Labial palpus short, stout, upturned against front; II segment enlarged preapically to 1.5× basal diameter, nearly straight, scaling rather appressed; III segment small, ca. 0.13 as long as II, hidden in its scaling. Ocelli absent or reduced to a trace. Periorbital strip scaled. *Forewing:* Broad, length 2.24–2.40× width; width of DC 0.17–0.19 its length; Cu_{1b} position variable, arising 0.53–0.66 along length of cell. Stem of M and chorda present, weak (not visible on unstained wing), M ending at M_2; R_4 and R_5 separate; CuP present. No costal fold in male. *Hindwing:* Sc + R_1 and Rs separate, Rs nearly complete with trace of crossvein; Rs and M_1 separate, closely adjacent or connate; M_3 and Cu_1 connate; CuP weak. *Male genitalia* (Fig. 4): Uncus slender, attenuate or shallowly bifid apically, minutely setate ventroapically. Socii sparganothine-like, with long, dense scaling. Gnathos produced into a slender, broad or bifurcate tip. Transtilla twisted, usually without median dentate knob. Valva simple, lacking

pulvinus, costal rim weak, sacculus strong, extending to ⅔, ending in a projection from margin. Aedeagus slender to stout, only slightly bent; vesica with cornuti of two forms: non-deciduous (?), thin, spine-like ones attached basally, and deciduous ones, broadened medially, attached laterally.

Female unknown.

The name *Sisurcana furcatana* was coined by Busck in the 1920's and used on specimens and a drawing in the USNM, though evidently not in a manuscript, and by Clarke in the 1940's on specimens in the BMNH. Included were paratypes of *Eulia umbellifera* Meyrick, 1926, and at least one specimen that is conspecific with neither that species nor *S. furcatana. Sisurcana* as presently conceived also includes *S. umbellifera, S. defricata* (Meyrick, 1926), *S. leprana* (Felder & Rogenhofer, 1875), *S. ranunculata* (Meyr., 1912) and at least 10 undescribed species (BMNH, USNM), all from Venezuela, Colombia, Bolivia, and Peru. Unfortunately, material is not available in sufficient series to enable association of the females with any of these; most likely there is marked sexual dimorphism. Until the female is known, the tribal status of *Sisurcana* is problematical.

It is possible that *S. ranunculata,* which has the forewing termen concave below the apex and a distinctive forewing pattern, is the male of *Anacrusis ruptimacula* (Dognin), new combination, or a similar species. The two show differences in sexual dimorphism comparable to those displayed by other *Anacrusis* species. However, there are no unassociated female *Anacrusis* specimens from the South American localities that have yielded most of the *Sisurcana* males, and the numbers of these suggest that females without typical atteriine corethrogyne scaling are the likely associates. For example, females of "*Tortrix*" *recurvana* Zeller have been taken at Rancho Grande, Venezuela, the type locality of *S. furcatana,* although not on the same dates. The cornuti deposited in their corpus bursae match those of *S. furcatana.* However, the chorda and M stem in *recurvana* are appreciably stronger than in *S. furcatana.*

The BMNH has males of undescribed *Siscurcana* and female specimens of at least three species with identical label data, from localities in Colombia and Peru. If these associations represent mates, females are larger than males, possess slightly to markedly emarginate costal margin of the forewing, the extreme of which is seen in *recurvana.* The forewing patterns provide no convincing clues to associate the pairs. These females lack specialized atteriine ovipositional scaling, but the genitalia are *Anacrusis*-like, with the ductus seminalis attached subbasally, followed by a long ductus bursae having weak sclerotization; the signum is a crease with shallow keel (*recurvana*) or a cone with long, acute keel.

Sisurcana furcatana **Powell, New Species**

Male.—Length of FW 9.9–12.4 mm (5n). Labial palpus short, length 1.15 eye diameter; scaling short, little flared, tan infused with variable red-brown exteriorly. Front whitish, crown scaling whitish mixed with red-brown. *Thorax:* Dorsal scaling pale to dark red-brown, reflecting a purplish sheen. Underside pale tan, coxae with variable dark brown, legs variable red-brown. *Forewing:* Subcostal area basally with a costally-directed scale flap (presumably a male secondary character). Costal half rust-brown with variable darker scaling, costal spots and poorly defined, subapical, triangular blotch; dorsal half heavily suffused with dark gray and variable dark brown mottling. Underside dark gray with pale red-brown subcostal area basally, costa narrowly whitish with dark spots of upperside reproduced,

termen rust colored. *Hindwing:* Dark brown, becoming blackish in anal area; fringe rust colored distally. Underside, disk gray becoming mottled rust distally, costal and subcostal area rust mottled with white. *Abdomen:* Dark gray reflecting purplish sheen; lateral and genital scaling rust colored. Genitalia as in Figure 4 (drawn from paratype, Rancho Grande, JAP prep. no. 5032; 3n).

Female unknown.

Holotype male.—VENEZUELA, Rancho Grande, Aragua, 1100 m, Jan. 17–20, 1978, blacklight, cloud forest (J. B. Heppner) (USNM). Paratypes: 1 ♂ same data as holotype, 1 ♂ same data except V-16-67 (C. J. Rosales, L. Fernandez S.); 1 ♂ E Cordillera, Colombia, 7200 ft, "10–20"; 1 ♂ Rio Toche Quindiu, Colombia, 2400 m (BMNH, UCB, USNM, VIZA).

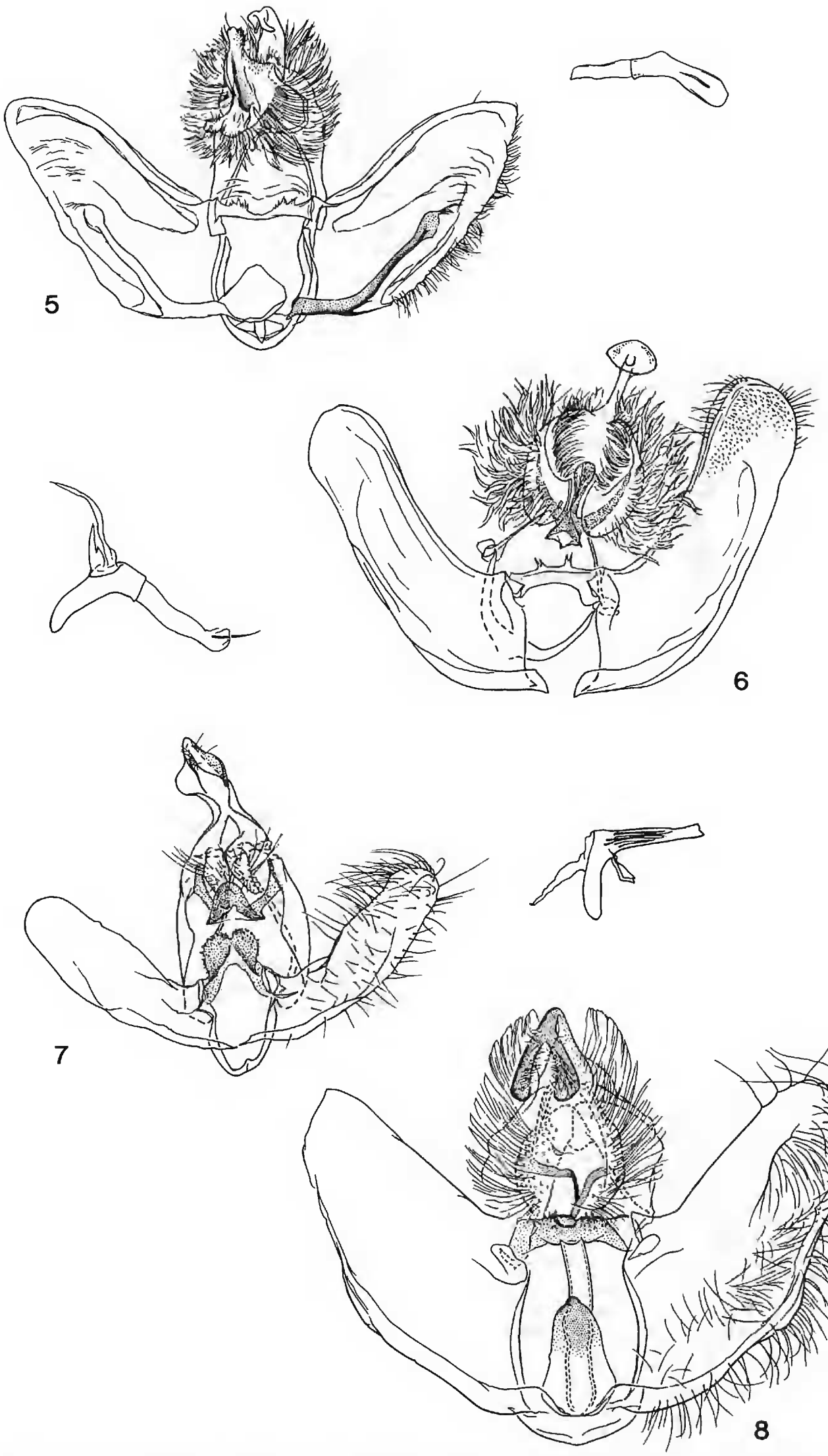
Archipimima Powell, New Genus

Type species.—*Tortrix flexicostalis* Dognin, 1908.

Head: Antenna unmodified; setulae elongate in male, 1.67× or greater the segment diameter, on raised ventral ridges; scaling in two well defined bands. Labial palpus elongate, upturned; II segment length 1.3× eye diameter, enlarged beyond middle 2× basal diameter, slightly curved, with broadly flared scaling; III segment small, 0.2 as long as II. Ocelli present. Periorbital strip narrowly bare posteriorly. *Forewing:* Length 2.5× width, costa strongly concave beyond middle; width of DC ca. 0.19 its length; Cu_{1b} arises 0.5 along length of cell. Chorda and stem of M present, weak, in cell, ending at M_2; R_4 and R_5 separate, CuP weakly developed. No costal fold in male. *Hindwing:* Sc + R and Rs separate, base of Rs and crossvein lost; Rs and M_1 closely approximate; M_3 and Cu_{1a} separate; CuP weak. *Male genitalia* (Fig. 5): Uncus slender, with a small apical hood, setate ventrally. Socii large, lobed, with short, stiff scales ventrally, long scaling anterolaterally. Transtilla narrow with dentate protuberances flanking middle. Valva lacking pulvinus; costal rim and sacculus well sclerotized, latter curving posteriorad into valva surface, with an enlarged but not free tip. Vesica with one (or more deciduous?) cornutus. *Female genitalia* (Fig. 16): Sterigma membranous with large, sclerotized lateral lobes. Ductus bursae with an elongate colliculum preceding the ductus seminalis, which originates 0.30–0.55 the length of d.b. from ostium; no antrum nor cestum. Corpus bursae large, globose, without accessory pouch, with a small, unsclerotized projecting pouch just basad to signum.

Sexual dimorphism.—Not as pronounced as in other non-mimetic Atteriini. Males possess moderately elaborate antennal setulae borne on raised ridges and a penicillus on the prothoracic tibia (weak in *flexicostalis*); the VIII abdominal tergum is elongated, hood-like over the genitalia. Females average larger and have slightly broader forewings, with a more deeply emarginate costa; VI, VII ventral scaling modified as in *Anacrusis* Zeller and *Atteria* Walker. The forewing color patterns are similar in the sexes.

The genus is proposed for four South American species, *A. flexicostalis, A. concavata* (Meyrick, 1930), *A. cosmoscelis* (Meyr., 1932), and *A. labyrinthopa* (Meyr., 1932), which superficially resemble some Holarctic *Archips* species in forewing shape and color pattern. The lack of marked sexual dimorphism and the undifferentiated scaling of the socii distinguish *Archipimima* from *Anacrucis* and related genera. Males and females of *A. flexicostalis* and *A. concavata* have been collected together in Peru and appear to be unequivocally associated (BMNH).



Figures 5–8. Male genitalia of Tortricinae, ventral aspect with valvae reflexed; aedeagus removed and shown in lateral aspect (except Fig. 8). 5. *Archipimima flexicostalis* (Dognin). 6. *Tinacrucis aquila* (Busck). 7. *Tina audaculana* (Busck). 8. *Holoptygma lurida* (Meyrick).

The former is selected as the type species because the holotype of *A. concavata* lacks its abdomen.

Tinacrucis Powell, New Genus

Type species.—*Homona aquila* Busck, 1914.

Head: Antennae usually unmodified; setulae in males moderately long, equal to width of flagellar segment (undescribed Venezuelan species), to more typically 1.5 to 2.5× segment width, in dense whorls; scaling in one band per segment. Labial palpus upturned, short, thickly scaled; II segment slightly enlarged distally, to 1.5× basal diameter, curved basally; III small, ca. 0.28 as long as II, nearly hidden in scaling of II. Ocelli apparently absent in most species (present in an undescribed species). Periorbital strip bare posteriorly, scaled anteriorly. *Forewing:* Variable in shape, costa in males weakly to strongly sinuate, emarginate in outer ⅓. Breadth ratio correspondingly variable, length 2.55–2.70× width. Width of DC 0.17–0.20 its length; Cu_{1b} originates at ca. 0.55 along length of cell; CuP present. Stem of M in DC well developed, usually with trace of fork, ending at M_2; accessory cell (chorda) present, weak in male; R_4 and R_5 stalked or separate; CuP present, short. No costal fold in male. *Hindwing:* Sc + Rs separate, Rs weak basally; Rs and M_1 closely approximate or connate; M_3 and Cu_{1a} connate in male, separate in female; CuP present, short or well developed. *Abdomen:* VIII segment enlarged in male, tergum forming a hood over genitalia. *Male genitalia* (Fig. 6): Uncus narrow, slightly enlarged apically to broadly capitate, with ventral setation. Socii triangulate, wrapped around gnathos, scaling differentiated into two types: huge, thick tufts of elongate scales laterally, shorter, stiff hairs posteroventrally. Gnathos tip elongate, spatulate. Transtilla narrow, with a pair of dentate projections near middle. Valva broad, curved posteriorly; no pulvinus; sacculus weakly defined basally, separated by a sclerotized band along inner face of valva, set in from anterior margin. Aedeagus slender, ca. 14–16 elongate cornuti, spine-like, deciduous with lateral attachment. *Female genitalia* (Fig. 17): Papillae anales setiferous nipples moderately raised. Sterigma a shallow bowl with large lateral lobes. Ductus bursae with membranous antrum proximal to a short colliculum, gradually enlarged and lightly sclerotized distally; ductus seminalis connects just distad of colliculum. Signum a scobinate patch, preceded by a small blind pouch (sometimes rudimentary).

Sexual dimorphism.—Extreme, although size not as variable and discrepancy not as great as in *Tina* n. gen.; female FW length 1.20–1.25× that of male. Forewing pattern differs markedly, males with reticulate patterning on yellow, females more or less unicolorous brown or with outwardly oblique bands suggested. Males have the elaborate antennal setulae and enlarged VIII abdominal segment, while females have specialized corethrogyne scaling of the abdominal venter, as in *Atteria* and *Anacrusis.*

The name *Tinacrucis* can be interpreted as of feminine gender. *T. aquila* is selected as the type because reared sibs from single egg masses are available that unequivocally demonstrate the association of the sexes.

Diagnosis.—Species of *Tinacrucis,* while superficially very similar to those of *Tina,* are most closely related to *Anacrusis* and perhaps the group may be treated best as a subgenus when the extent of variation in *Anacrusis* is better understood. The new genus is distinguished by having the sinuate costa similar in both sexes (unmodified in male *Anacrusis,* concave termen in females), by the markedly

different forewing pattern between the sexes, elaborate antennal setulae in males and by lacking a well developed sacculus in the male genitalia. The valvae are not strongly curved posteriorly and thus are similar to the form in *Tina.*

The new genus includes the following described species: *T. aquila,* with the female *T. consobrina* (Bsk., 1914) as a subjective synonym, *T. apertana* (Wlsm., 1914), *T. patulana* (Walker, 1863), and *T. sebasta* (Wlsm., 1914). The last, which was described from a male from Guatemala, is virtually indistinguishable morphologically from the darker *T. aquila* in Panama and Costa Rica. *T. apertana* was based on the female, but I have reared F_1 sibs from Nuevo Leon that demonstrate the male is not another of the described species. In addition there are several undescribed species in Mexico, one of which ranges into southern Arizona.

Tinacrucis patulana was described from Oaxaca, Mexico, and the unique female type is lacking its abdomen (BMNH). Walsingham (1914) considered *Tortrix audaculana* Busck, 1907, to be a synonym of *T. patulana,* but on the basis of size, it seems more likely that *patulana* is a *Tinacrucis* rather than *Tina* according to present concepts. The type specimen of *T. patulana* is larger (FW length 18.9 mm) and has more distinct, black, transverse strigulae on the forewing than any specimen of *Tina audaculana* I have seen (FW 12.5–16.0 mm). Material collected in Oaxaca recently by E. C. Welling and K. Wolf includes at least two species of *Tinacrucis* but not in series that permit unequivocal associations of males and females. One female matches the Walker type in FW pattern but is smaller (FW 16.6 mm).

Tina Powell, New Genus

Type species.—*Tortrix audaculana* Busck, 1907.

Head: Antenna serrate in male, setulae greatly elongated, 3.0–3.3× segment width, in dense segmental whorls from raised ridges; scaling in one band per segment. Labial palpus upturned, short, thickly scaled; II segment only slightly expanded distally, to ca. 1.2× its basal width; slightly curved; III small, ca. 0.20 as long as II, nearly hidden in scaling of II. Ocelli apparently absent, reduced to a trace. Periorbital strip bare posteriorly, scaled anteriorly. *Forewing:* Costa sinuate in both sexes. Length 2.6–2.7× width at costal concavity. Width of DC 0.17–0.19 its length; Cu_{1b} originates at ca. 0.53–0.60 along length of cell. Stem of M present in cell, ending at M_2, trace of fork sometimes present in female; accessory cell (chorda) present, weak in male; $R_4 + R_5$ stalked ¼–⅜ their length in male, very short-stalked in female; CuP present. No costal fold in male. *Hindwing:* Sc and Rs separate, Rs weak basally; Rs and M_1 stalked or closely approximate; M_3 and Cu_{1a} connate; CuP weak. *Abdomen:* segment VIII normal, not enlarged. *Male genitalia* (Fig. 7): Uncus moderately broad basally, simple apically or expanded preapically to form a triangulate or T-shaped hood, or with enlarged lateral lobes projecting ventrally; sparsely setate ventrally. Socii elongate, pendant, broadest at middle, narrowed apically, without differentiated scaling. Gnathos tip broad, rounded. Transtilla heavily sclerotized with a pair of broad, fan-like, dentate lobes projecting posteriorly. Valva narrow, not much turned posteriorly, without armature or pulvinus; sacculus weakly differentiated in basal area, narrow. Aedeagus slender; 8–10 slender, spine-like, deciduous cornuti. *Female genitalia:* Papillae anales, posterior lobes slightly broader, setiferous nipples moderately raised. Sterigma a broad bowl with large lateral lobes, surface scobinate. Ductus bursae with membranous antrum proximal to a rather elongate colliculum, gradually enlarging

to corpus bursae; ductus seminalis connects just distal to colliculum. Signum narrow, originating from a weakly sclerotized patch.

Sexual dimorphism.—Extreme: Females of *T. audaculana* from Veracruz average much larger, range in FW length = 1.05–1.60× that of males, an impression that is enhanced by the relatively broader forewing of the female and the much bulkier abdomen. Females' forewings have a more sinuate costa. Males have a delicate network pattern of purplish brown on yellow, with a costal triangle weakly defined, while forewings of females are brownish, showing a typical Archipini-like pattern of pre- and postmedian, outwardly transverse bands, of whitish. Females lack the elaborate antennal setulae of males, while males have none of the enormous corethrogyne scaling of the abdominal venter.

Tina is a name used by August Busck[1] more than 50 years ago, on specimens of *T. audaculana.* Following Walsingham (1914), Busck considered *audaculana* to be a synonym of *patulana* Walker. Later the name *Tina* was applied to Obraztsov in manuscript to a diverse conglomeration including *Anacrusis ruptimacula* (Dognin) and *Tinacrucis sebasta* (Walsingham) but not other described species now assigned to *Anacrusis* and *Tinacrucis.*

As noted above, the type specimen of *Tinacrucis patulana* is larger than any known *Tina,* and is therefore more likely a species of *Tinacrucis.* Hence, *T. audaculana,* which was described from Orizaba, Mexico, is designated as the type; sufficient collections exist from the area of Orizaba, Cordoba, and Fortin de las Flores (100+ specimens, BMNH, UCB, USNM) to permit circumstantial association of the sexes with confidence. In addition, I have reared F_1 sibs to associate the sexes, of *T. audaculana* in Costa Rica and of two undescribed Costa Rican species.

Diagnosis.—*Tina* is most similar to *Tinacrucis,* differing primarily by the more extreme difference in size of the sexes, by lacking the enlarged VIII abdominal segment of male *Anacrusis* and *Tinacrucis,* and by the male genitalia, which differ markedly; in particular the simple socii without specialized scaling, and the broad, fan-shaped, transtilla distinguish *Tina.* Superficially, both males and females of *Tina* closely resemble those of several species of *Tinacrucis,* adding to the confusion in associating sexes within species.

Holoptygma Powell, New Genus

Type species.—*Ctenopseustis lurida* Meyrick, 1912.

Head: Antenna in male pectinate, each ridge bearing 10–12 long setulae, ca. 2× segment diameter, on each side; scaling in 2 bands per segment. Labial palpus slender, nearly porrect, with broad scaling dorsally; II segment moderately enlarged dorsally, to 1.66 basal diameter, slightly curved; III ca. 0.45 as long as II. Ocelli minute. Periorbital strip bare posteriorly. *Forewing:* Broad, length ca. 2.1× width (costal fold reflexed); width of DC 0.20 its length; Cu_{1b} originates 0.70 along length of cell; chorda and stem of M with trace of fork present in cell, ending between M_2 and M_3; R_4 and R_5 separate; CuP present. Male with an elongate (0.8 FW length) costal fold. *Hindwing:* Sc + R_1 and Rs adjacent, crossvein and base of Rs lost; Rs and M_1 closely approximate; M_3 and Cu_{1a} connate; CuP represented by a trace. *Abdomen:* VIII tergum moderately enlarged. *Male genitalia* (Fig. 8): Uncus deeply bifurcate apically, with ventral setae. Socii broad, oval, pendant,

[1] Named after Busck's daughter, according to J. F. G. Clarke (in litt.).

with elongate, dense scaling. Transtilla heavily sclerotized, dentate except at middle. Valva simple, pulvinus weak; sacculus weakly differentiated, narrow. Aedeagus slightly bent, cylindrical; vesica with deciduous cornuti having basal attachment. *Female genitalia:* Papillae anales oval. Sterigma simple, with broad, rounded lateral lobes. Ductus bursae without antrum, colliculum, or cestum. Corpus bursae with a small blind pouch posterad to signum.

Sexual dimorphism.—Pronounced; male with pectinate antennae and a huge costal fold. Female with well developed corethrogyne scaling, differentiated on VI and VII. Male FW strongly mottled with dark pattern, HW dark; FW of female primarily yellow, HW white.

The association of female is circumstantial. Meyrick described *H. lurida* on the basis of males from San Antonio, Colombia, and there are 7 males that appear to be conspecific with the types, from 5 localities in The Cordillera de Carabaya, Peru, collected in 1902–1904 by Ockenden (BMNH). There are 2 females from 2 of these sites which are associated with the males on the basis of similarity in size and facies. The females differ by lacking the costal fold and having the forewing primarily yellow, rather than heavily mottled with rust, with rust-brownish discal, tornal and terminal markings (which are suggested in paler examples among males), and females have a whitish, lightly mottled rather than a dark hindwing. The female characters of *Holoptygma* are summarized from these specimens (BM slide 23452).

TRIBE EULIINI, New Status

Euliae Kuznetzov and Stekol'nikov, 1977 (subtribe).

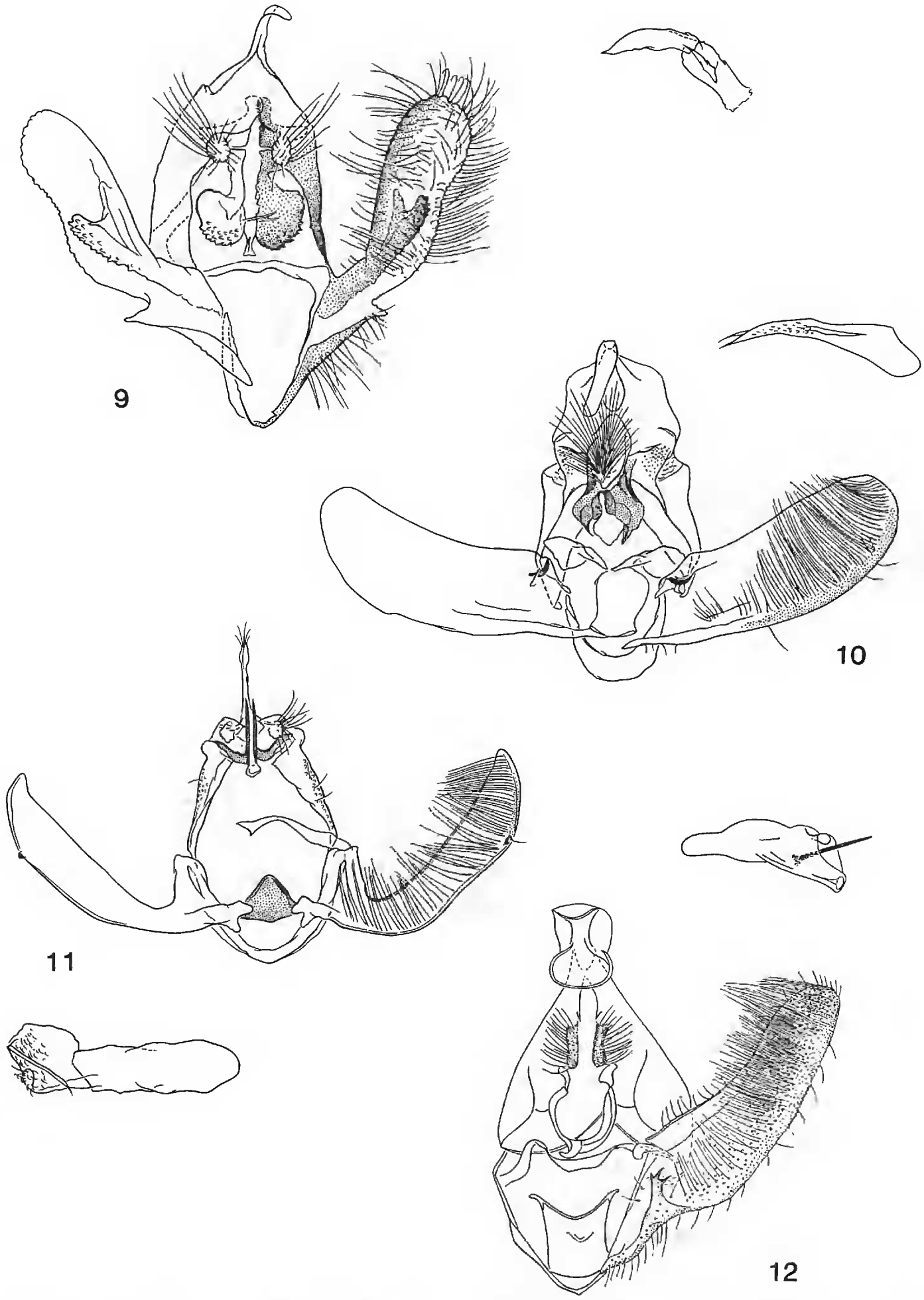
The following characters are shared by all the genera discussed here: *Head:* Antenna unmodified. Chaetosema well developed. *Forewing:* stem of M and chorda in cell absent or reduced to a trace; R_3, R_4 and R_5 separate, R_4 to costa, R_5 to termen. No upraised scale rows or tufts. No costal fold in male. *Hindwing:* Ten veins (including CuP); Sc + R_1 and Rs separate, crossvein and base of Rs lost. No cubital hair pecten. No costal penicillus in male. *Abdomen:* Dorsal pits absent. *Male genitalia:* Uncus well developed, without ventral setation. Saccus not differentiated. Neither hami nor subscaphium developed. Gnathos arms joined. Valva simple, narrow, lacking differentiated pulvinus, "clasper" and brachiola. Aedeagus without external spurs; vesica without deciduous cornuti. *Female genitalia:* Papillae anales flat, unmodified, without modified setae. Ductus bursae without antrum, colliculum or cestum. Corpus bursae without accessory pouch.

Sexual dimorphism.—Characteristically slight throughout the tribe, although the forewing pattern differs in some genera. Females usually slightly larger. Males lack secondary features except elongated antennal setulae. Females lack specialized scaling associated with oviposition.

Neoeulia Powell, New Genus

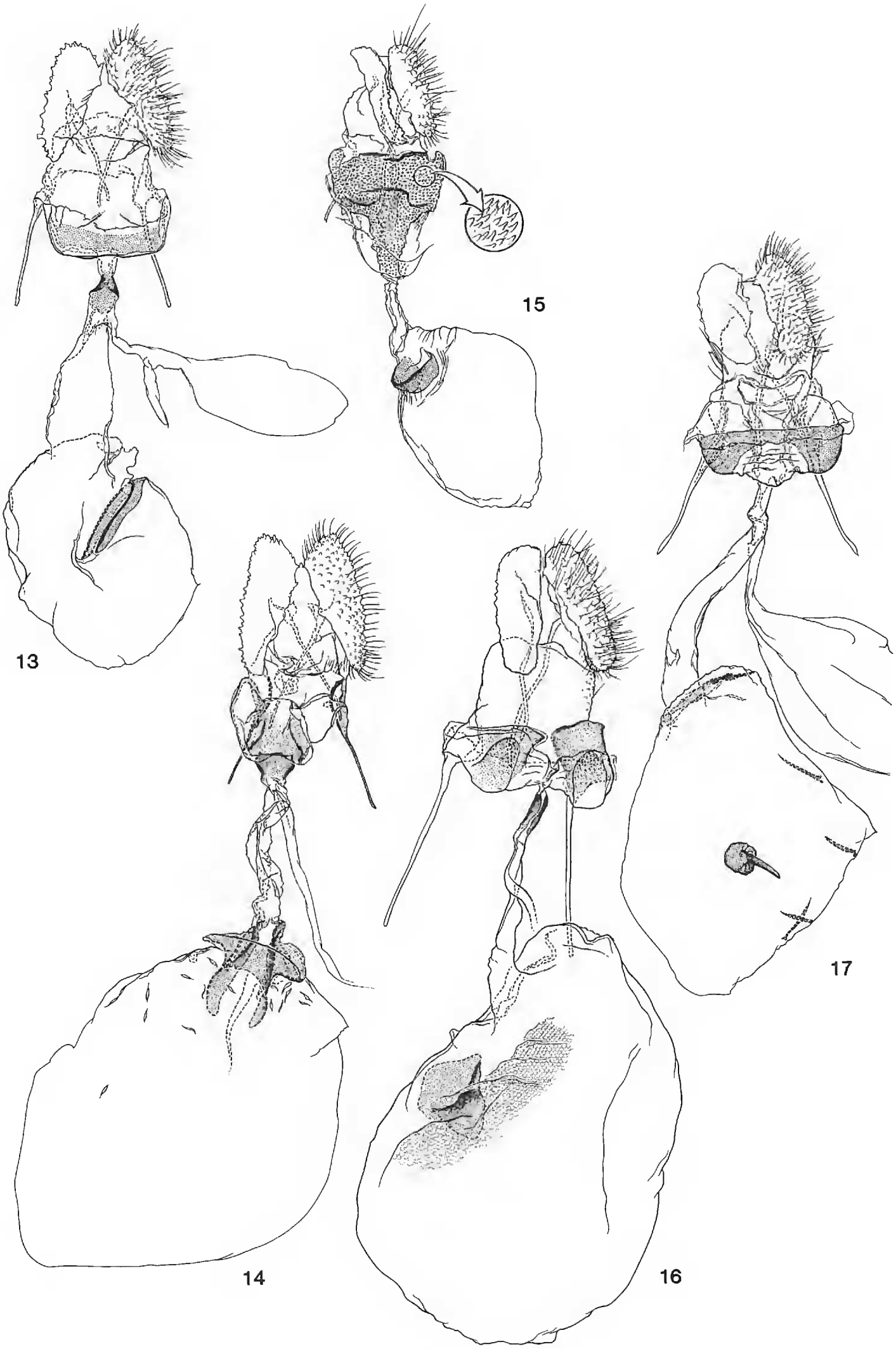
Type species.—*Phalonia dorsistriatana* Walsingham, 1884.

Head: Antennal setulae in male ca. 0.75 as long as segment diameter; scaling in two well developed bands per segment. Labial palpus porrect, II segment moderately enlarged distally, 1.6× basal diameter, slightly curved, with broadened scaling; III ca. 0.45 as long as II. Maxillary palpus well developed, upturned, scaled, longer than pilifer. Scaling of frons appressed, sparse. Ocelli small. Peri-



Figures 9–12. Male genitalia of Tortricinae, ventral aspect with valvae reflexed; aedeagus removed and shown in lateral aspect. 9. *Neoeulia dorsistriatana* (Walsingham). 10. *Quasieulia mcguffini* Powell. 11. *Anopinella ophiodes* (Walsingham). 12. *Apotomops wellingtonana* (Kearfott).

orbital strip narrowly bare. *Forewing:* Length 2.9–3.0× width; DC ca. 0.55 FW length; width of DC ca. 0.17 its length; Cu_{1b} arises 0.67 along length of cell. Chorda and stem of M represented by a trace in cell; M_3 and Cu_{1a} separate; CuP present.



Figures 13–17. Female genitalia of Tortricinae, ventral aspect. 13. *Sparganopseustis martinana* Powell. 14. *Paramorbia rostellana* (Zeller). 15. *Sparganothina xanthista* (Walsingham). 16. *Archipimima flexicostalis* (Dognin). 17. *Tinacrucis aquila* (Busck).

Hindwing: Ten veins (including CuP); humeral vein absent; Sc + R_1 and Rs separate, base of Rs and crossvein lost; Rs + M stalked; M_3 and Cu_{1A} separate; CuP present. *Male genitalia* (Fig. 9): Uncus slender, unmodified. Socii short, globose, attached basally, with long setae, not fused to gnathos. Gnathos heavily sclerotized, dentate. Transtilla a simple, complete band, not joined to pulvinus. Valva elongate; sacculus differentiated, narrow, costa with heavily sclerotized ornamentation directed posteriorly. Aedeagus short, curved; vesica with sclerotized, curved band. *Female genitalia* (Fig. 18): Sterigma a broad band posterior-dorsad of ostium. Apophyses, VIII–IX+X segmental membrane, and bursa copulatrix short, so the whole genital structure is compact. Ductus bursae very short, almost lost. Corpus bursae simple; signum a broad, U-shaped band from proximal end of bursa.

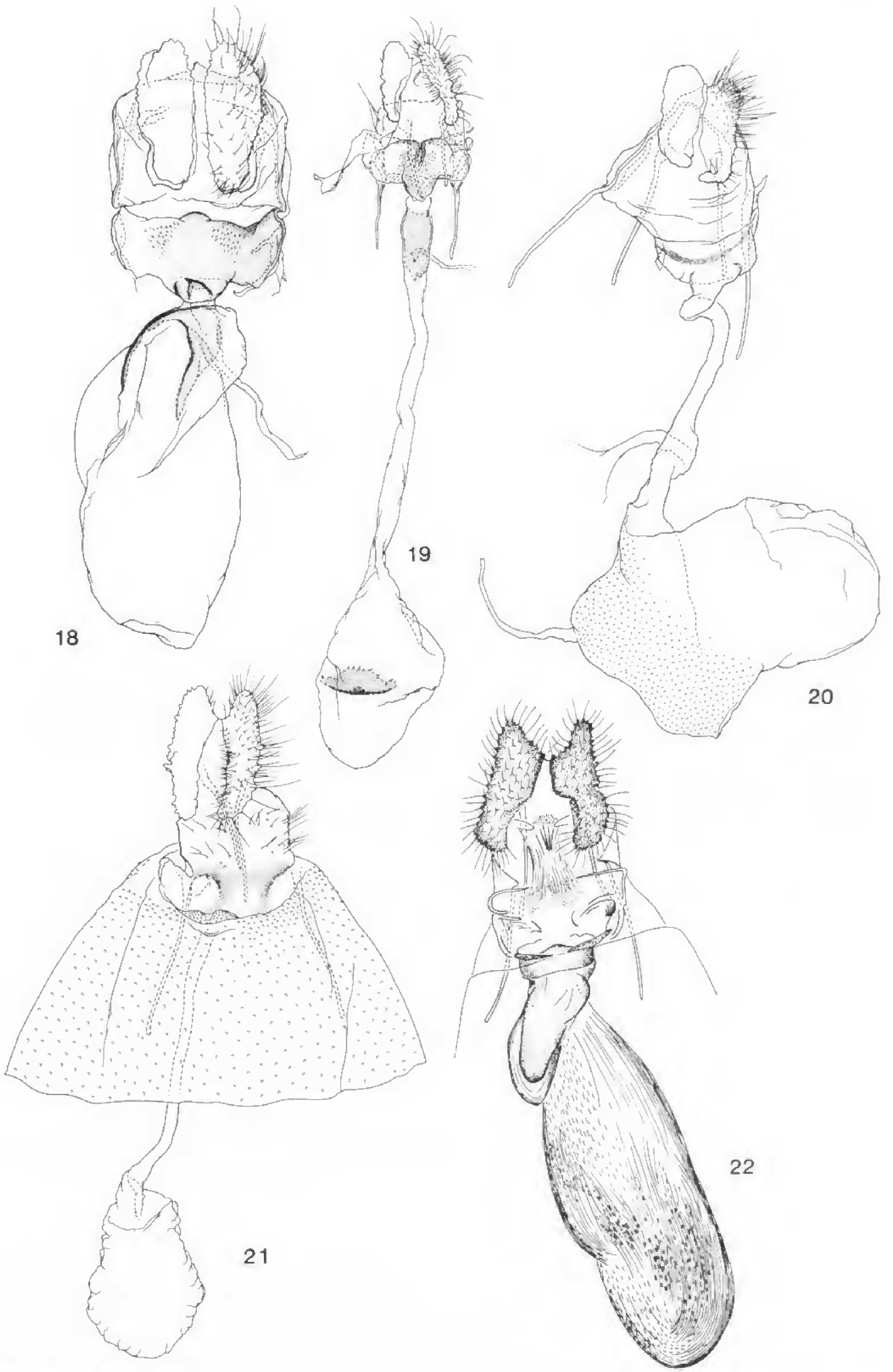
Neoeulia dorsistriatana was described more than a century ago from a male specimen labelled 'Arizona' and none has been collected there since. However, I have a series of females from the vicinity of El Salto, Durango, Mexico, that are phenotypically quite similar to the type. Hence, the association for the female characters in the generic description is provisional, pending discovery of both sexes in one population. The El Salto specimens may represent a closely related species. In addition to *N. dorsistriatana,* I have two or three undescribed species from Veracruz and Puebla, Mexico, in which males and females are phenotypically similar but are not associated in series.

Quasieulia Powell, New Genus

Type species.—*Quasieulia mcguffini* Powell, new species.

Head: Antennal setulae in male rather short, 0.75× segment diameter; scaling in two well developed bands per segment. Labial palpus nearly porrect; II segment only slightly enlarged distally, ca. 1.5× basal diameter, slightly curved, with spreading scaling; III less than 0.25 as long as II. Maxillary palpus rudimentary. Scaling of frons smooth below middle, roughened above. Ocelli absent. Periorbital strip with a single row of elongate scales posteriorly. *Forewing:* Length 2.5× width; length of DC ca. 0.55 FW length; width of DC 0.15 its length; Cu_{1b} arises ca. 0.55 along length of cell; M_3 and Cu_{1a} separate; CuP represented by a trace. Apex acute, subfalcate. *Hindwing:* Humeral vein absent; Sc + R_1 and Rs separate, crossvein and base of Rs lost; Rs and M_1 stalked; M_3 and Cu_1 connate; CuP short. *Male genitalia* (Fig. 10): Uncus heavily sclerotized, strongly curved. Tegumen heavily sclerotized and sculptured nearly completely to mid-venter. Socii slender, attenuate, pendant from basal attachment; setate, unscaled, not fused to gnathos. Gnathos smooth. Transtilla complete, narrowed medially, not joined to pulvinus. Valva with sacculus differentiated basally, narrow, simple. Aedeagus simple, gradually tapered from phallobase; vesica with one cornutus. *Female genitalia* (Fig. 19): Papillae anales narrow, well separated. Sterigma a broad shield dorsad to ostium, split medially, with prominent lobes posteriorly. Ductus bursae elongate, slender, straight, with a complete, weakly sclerotized band, possibly homologous with a colliculum. Corpus bursae simple, small; signum funnel-like, flattened into a keel projecting into bursa.

In addition to the type species, *Quasieulia* includes *Q. hirsutipalpis* (Walsingham, 1914) and *Q. endela* (Wlsm., 1914), both of which are known from single



Figures 18–22. Female genitalia of Tortricinae, ventral aspect. 18. *Neoeulia dorsistriatana* (Walsingham). 19. *Quasieulia mcguffini* Powell. 20. *Anopinella ophiodes* (Walsingham). 21. *Chileulia stalactitis* (Meyrick). 22. *Apotomops wellingtonana* (Kearfott).

male specimens from Guatemala. Superficially these moths resemble *Neoeulia,* but the fundamentally different genitalia features, particularly the modified tegumen and lack of costal ornamentation on the valva in the male and the long, thin ductus bursae in the female of *Quasieulia,* indicate that the two genera are not closely related. The genitalia characteristics suggest that *Quasieulia* may be most closely related to *Apotomops* Powell & Obraztsov, among described genera, although the two are dissimilar phenotypically.

Quasieulia mcguffini Powell, New Species

Male.—Length of FW 8.5–9.3 mm (3n). *Head:* Labial palpus moderately elongate, II segment length 1.5× eye diameter; scaling pale straw yellow with scattered pale brown exteriorly. Scaling of crown pale straw colored. *Thorax:* Dorsal scaling pale straw colored with pale brownish tips; venter whitish, legs dusted with brown. *Forewing:* Pale straw colored with faint brownish clouding, highlighted by two metallic gray-brown lines, one outwardly angled across half the wing from dorsal margin before middle, the other subterminal before fringe; latter followed by dark ochreous subtending the fringe which is whitish except brownish at tornus. Underside pale brown with cream colored patches along outer half of costa, corresponding to pale areas of upperside. *Hindwing:* shining whitish; pale brownish along veins and outer margin. Fringe white. Underside white. *Abdomen:* Pale brownish dorsally; genital scaling and underside whitish. *Genitalia:* As in Figure 10 (drawn from paratype, JAP prep. no. 2621; 2n).

Female.—Length of forewing 9.3–10.4 mm (6n). Essentially as described for male except FW color pattern appreciably more distinct, the pale brown pattern contrasting distinctly with the pale yellow ground, which occupies basal area to the submedian line from before mid-dorsum, curving outward to costa beyond middle; and in the brownish distal half, a pale costal patch and poorly defined patches in middle and above dorsal margin; submedian and subterminal lines apparently not as distinctly metallic as in male. Genitalia as in Figure 19 (drawn from paratype, JAP prep. no. 5361; 3n).

Holotype male and allotype female.—MEXICO, 10 mi W of El Salto, Durango, 8800 ft, July 19 and 23, 1964 (J. Powell) (UCB). Paratypes: 1 ♂ same data as holotype; 1 ♂, 3 ♀ same data except 9000 ft, VI-30 to VII-10-64 (W. C. McGuffin), 2 ♀ same data except VII-18,29-64 (J. E. H. Martin) (CNC, UCB).

Anopinella Powell, New Genus

Type species.—*Eulia isodelta* Meyrick, 1912.

Head: Antennal setulae elongate in male, equal to segment width at base, 1.3× segment width at ⅓. Labial palpus porrect, elongate, slightly broadened by scaling; II segment expanded, 1.6× width at base, slightly curved; III ca. 0.4 as long as II. Maxillary palpus rudimentary, hidden. Frons smooth-scaled with overhanging crown tuft. Ocelli present, reduced. Periorbital strip partially bare. *Forewing:* Length 2.3–2.4× width, DC 0.55–0.60× FW length; width of DC ca. 0.21–0.23 length; Cu_{1b} originates at 0.60 the length of DC; M_3 and Cu_{1a} connate or separate; CuP absent. Chorda defined by a trace not visible basally. *Hindwing:* Sc and Rs closely approximate; Rs and M_1 closely approximate; M_3 and Cu_{1a} connate; CuP represented by a trace. *Male genitalia* (Fig. 11): Uncus slender, strongly curved, slightly enlarged preapically. Socii small, ovate, sparsely setate. Gnathos arms

joined by membrane, not or slightly flared distally, spinulose apically. Transtilla complete, thin, non-dentate. Valva with or without a strong spur at lower corner of cucullus. Aedeagus short, moderately stout, cornuti present, one long spine or crease plus tiny spicules all over vesica. *Female genitalia* (Fig. 20): Papillae anales moderately broad, anteriorly narrowed and turned mesad. Sterigma a simple bowl. Ductus bursae narrow, membranous, ductus seminalis connects at ca. 0.75 distally along length of d.b. Corpus bursae rather elongate, distally extended caudad. Signa lacking, bursa with dense lining of spiculae.

Anopinella is a name that August Busck affixed to specimens of an apparently undescribed species from Panama more than 50 years ago, at a time when *Anopina* Obraztsov, 1962, also existed as an unpublished concept, indicated by Busck's labels. Obraztsov (1963) thought *Anopina* originated as an arbitrary combination of letters and treated it as a Latin noun of feminine gender. Therefore, *Anopinella* can be interpreted as feminine.

In addition to the type species, *A. isodelta,* from Colombia, *Anopinella* includes *A. ophiodes* (Walsingham, 1914) described from Panama, and *A. homosacta* (Meyrick 1930), from Argentina. There are at least 3 apparently undescribed, similar species, from Venezuela, Panama, Jamaica (USNM). In addition, there are USNM specimens from Volcan Santa Maria, Guatemala, and Juan Vinas, Costa Rica, that may represent another undescribed species or *A. ophiodes.* All of these are similar in wing pattern and in genitalia form. Nothing is known of the biology of any *Anopinella* species.

Diagnosis.—Both superficially and structurally, the new genus seems most similar to *Anopina* Obraztsov, among described genera. *Anopinella isodelta* differs primarily in lacking the sacculus armature of *Anopina,* in having a stout aedeagus that lacks the expanded phallobase seen in *Anopina,* and in the female by its markedly different arrangment of the ductus bursae, ductus seminalis and corpus bursae positions.

Chileulia Powell, New Genus

Type species.—*Eulia stalactitis* Meyrick, 1931.

Head: Antennal setulae in male short, ca. 0.4 segment width. Labial palpus elongate, porrect, smooth scaled basally, flaring distally on II segment, which is expanded ca. 2× its basal width, slightly curved; III ca. 0.5 as long as II, almost entirely exposed. Maxillary palpus, ocelli present. Periorbital strip scaled. *Forewing:* Length 2.5–2.6× width; DC ca. 0.60× FW length; width of DC ca. 0.20× its length; Cu_{1b} originates at ca. 0.63 along length of DC. CuP short, at margin; M_3 and Cu_{1a} separate. Accessory cell defined by a weak chorda. 1A + 2A rather strongly bowed beyond the basal fork. *Hindwing:* Sc and Rs separate; Rs and M_1, stalked; M_3 and Cu_{1a} separate; CuP present. *Male genitalia* (Clarke, 1958, pl. 69): Uncus short, slender. Socii small, boot-shaped, with long setae. Gnathos strongly sclerotized, tip flared, smooth. Transtilla partially developed, sclerotized as a frail bridge only over middle half. Valva with sclerotized costa; well-developed sacculus, ending in a free, flared tip at distal ⅔ of valva margin. Aedeagus slender, pistol-shaped, no visible cornuti. *Female genitalia* (Fig. 21): Papillae anales nearly parallel-sided, broadest anteriorly. Sterigma a simple bowl. Ductus bursae slender, elongate, frail. Ductus seminalis connects at proximal end of corpus bursae, which is without signum or spiculae.

The name *Chileulia* can be interpreted as a noun of feminine gender. The genus is monobasic, but "*Eulia*" *wilkinsonii* (Butler, 1883), may prove to be congeneric when its structural characters are known. *C. stalactitis* has been reared from a variety of situations associated with fruit crops in Chile: "grape" (1943–1944), "grape(fruits)" (1954), "orange" (1943), "plum" (1954), "apricot leaves" (1955), and "larva in fruit *Prosopis tamarugo*" (Chilean carob) (1956).

Diagnosis.—*Chileulia stalactitis* is most similar, both superficially and structurally, to *Anopina,* among described genera. Although there is considerable variation in phenotype, possibly representing seasonal or local geographical forms, the variation does not appear to be sex linked, as it is in *Anopina triangulana* (Kearfott) in North America. Both a pale form with distinct dark costal triangle, resembling males of *A. triangulana,* and a dark form like females of that species, occur in both sexes of *C. stalactitis.*

Male genitalia of *C. stalactitis* have a well developed uncus, not visible in Clarke's illustration (1958, pl. 69). It curves towards the venter in unflattened preparations. The tegumen in short, giving a stout appearance to the genitalia, similar to that of *Decodes* Obraztsov.

Apotomops Powell & Obraztsov, New Genus

Type species.—*Olethreutes wellingtonana* Kearfott, 1907.

Head: Antennal setulae in male minute, less than 0.1 as long as segment width. Labial palpus upturned, narrow, smooth scaled, II segment moderately expanded distally, to ca. 1.7 times basal width, slightly curved; III ca. 0.45 as long as II. Maxillary palpus longer than pilifer, scaled. Frons smooth scaled. Ocelli reduced in size. Periorbital strip bare. *Forewing:* Length 2.75 to 2.9× width, in female slightly broader than male; length of DC ca. 0.60 FW length; width of DC 0.19 its length; Cu_{1b} originates at 0.55–0.58 along length of cell; M_3 and Cu_{1a} separate; CuP short. Chorda represented by a trace. *Hindwing:* Sc and Rs separate, Rs and M_1 closely approximate or stalked; M_3 and Cu_{1a} short-stalked; CuP present. *Male genitalia* (Fig. 12): Uncus broad, capitate, with ventral expansion at base. Socii linear but not freely pendant, densely setate. Gnathos with broad lateral expansions subtending a thin tip, smooth. Transtilla complete, narrow, non-dentate. Valva parallel-sided, with a weak sacculus to basal ⅓ bearing a 3-pronged projection at posterior corner. Aedeagus short, blunt, with dorsal concavity; vesica with one large spine-like cornutus, attached basally. *Female genitalia* (Fig. 22): Papillae anales with posterior lobe larger, with elongated setae-bearing nipples. Sterigma a shallow, bilobed bowl, preceded by lateral, sclerotized concavities. Ductus bursae with small tapered side pouch, corpus bursae and ductus seminalis joining at antrum. No signa; corpus bursae lined with fine scobination.

Sexual dimorphism.—Forewing slightly narrower in male.

The new genus was recognized by August Busck, who applied the name *Eneria* on specimens many years ago. That designation was continued in manuscript by Obraztsov, but the name is preoccupied by *Eneria* Donisthorpe, 1948 (Hymenoptera). The new genus contains two described species, *P. wellingtonana* in the western U.S. and *P. texasana* (Blanchard & Knudson, 1984) in west Texas and Nuevo Leon. Specimens from the western Cordillera of Mexico appear to differ and may be found to represent a third species. Nothing is known about the biology.

Diagnosis.—*Apotomops* appears to be most closely related to *Bonagota* Ra-

zowski among described genera, although there are marked differences in genitalia. The wing venation is similar, with R_1 and R_2 originating widely separated, R_4 and R_5 close together on the forewing. Both genera possess the peculiar accessory pouch to the antrum, have the ductus bursae greatly reduced, and lack signa, so there is close similarity in female genitalia, as compared with other genera of Euliini. The highly modified uncus and tegumen distinguish members of *Apotomops* from all related genera I have seen.

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